
Effect of geraniol on rat cardiomyocytes and its potential use as a cardioprotective natural compound.

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Public Summary:

Essential oils from plants contain components with pharmacological properties. Geraniol, which is abundant in essential oils from palmarosa, ginger, lemon, lavender, orange and rosemary has anti-tumoral and anti-inflammatory properties. Here, we showed that Geraniol can also be a natural protective substance for the heart. Using heart muscle cells in culture we found that Geraniol protects the cells from oxidative stress and improves their survival under conditions similar to those occurring during a cardiac infarct.

Scientific Abstract:

AIMS: Reactive oxygen species (ROS) are generated in the ischaemic myocardium especially during early reperfusion and affect myocardial function and viability. Monoterpenes have been proposed to play beneficial roles in diverse physiological systems; however, the mechanisms of action remain largely unknown. This study aims to assess the effect of monoterpene geraniol (GOH) on neonatal rat ventricular cardiomyocytes (NRVCs) subjected to oxidative stress. **MAIN METHODS:** We used an in vitro model of hypoxia-reoxygenation. Cardioprotective (AMPK) and cardiotoxic (ERK1/2, ROS) signaling indicators were measured. Assays were performed by fluorogenic probes, MTT assays and Western-blot. **KEY FINDINGS:** We determined that the addition of GOH (5-200µM) to cultured normoxic and hypoxic-NRVCs diminished the endogenous production of ROS in stressed cardiomyocytes. We observed that GOH treatment increased pAMPK levels and decreased pERK1/2 levels in cultured NRVCs. **SIGNIFICANCE:** This report suggests that GOH is a candidate cardioprotective natural compound that operates by blunting the oxidative stress signaling that is normally induced by hypoxia-reoxygenation.

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